

What is Claimed is:

1. An optical input preamplifier, comprising:

a photodiode for converting an input optical signal into a photocurrent as an output current;

5 means for pre-amplifying said output current from said photodiode, wherein said output current is pre-amplified to form a pre-amplifying current; and

an output circuit device converting said pre-amplifying current into an output signal.

10 2. The optical input preamplifier, as recited in claim 1, wherein said pre-amplifying means comprises a feedback circuit creating a feedback signal in responsive to said output current from said photodiode to substantially form said pre-amplifying current, and an emitting follower electrically connected to said feedback circuit to output said pre-amplifying current therefrom.

15 3. The optical input preamplifier, as recited in claim 2, wherein said feedback circuit comprises a first transistor electrically connected with said photodiode and a second transistor electrically coupled with said first transistor such that when said output current from said photodiode is transmitted to said second transistor through said first transistor, said second transistor forms said feedback signal and transmits back to said first transistor so as to form said pre-amplifying current.

20 4. The optical input preamplifier, as recited in claim 3, wherein said first transistor is a NPN transistor and said second transistor is a PNP transistor, wherein said second transistor is electrically coupled with said first transistor to form a positive feedback circuit of said feedback circuit.

25 5. The optical input preamplifier, as recited in claim 3, wherein said first transistor is a PNP transistor and said second transistor is a NPN transistor, wherein said second transistor is electrically coupled with said first transistor to form a positive feedback circuit of said feedback circuit.

6. The optical input preamplifier, as recited in claim 4, wherein said feedback circuit further comprises a plurality of diodes electrically coupling between said first and second transistors, wherein said diodes are electrically connected in a series connection.

5           7. The optical input preamplifier, as recited in claim 5, wherein said feedback circuit further comprises a plurality of diodes electrically coupling between said first and second transistors, wherein said diodes are electrically connected in a series connection.

10           8. The optical input preamplifier, as recited in claim 3, wherein said emitting follower comprises a third transistor electrically coupled with said first transistor to receive said pre-amplifying current therefrom and an inverting amplifier for outputting said pre-amplifying current from said third transistor.

15           9. The optical input preamplifier, as recited in claim 4, wherein said emitting follower comprises a third transistor electrically coupled with said first transistor to receive said pre-amplifying current therefrom and an inverting amplifier for outputting said pre-amplifying current from said third transistor.

20           10. The optical input preamplifier, as recited in claim 5, wherein said emitting follower comprises a third transistor electrically coupled with said first transistor to receive said pre-amplifying current therefrom and an inverting amplifier for outputting said pre-amplifying current from said third transistor.

          11. The optical input preamplifier, as recited in claim 10, wherein said third transistor is a NPN transistor electrically coupled with said first transistor to direct said pre-amplifying current to said inverting amplifier.

25           12. The optical input preamplifier, as recited in claim 11, wherein said third transistor is a PNP transistor electrically coupled with said first transistor to direct said pre-amplifying current to said inverting amplifier.

          13. The optical input preamplifier, as recited in claim 8, wherein said inverting amplifier has two output ends respectively connecting with said output circuit unit for outputting said pre-amplifying current thereto and connecting with a feedback

resistance to feedback said pre-amplifying current to said first transistor through said feedback resistance.

14. The optical input preamplifier, as recited in claim 11, wherein said inverting amplifier has two output ends respectively connecting with said output circuit unit for outputting said pre-amplifying current thereto and connecting with a feedback resistance to feedback said pre-amplifying current to said first transistor through said feedback resistance.

15. The optical input preamplifier, as recited in claim 12, wherein said inverting amplifier has two output ends respectively connecting with said output circuit unit for outputting said pre-amplifying current thereto and connecting with a feedback resistance to feedback said pre-amplifying current to said first transistor through said feedback resistance.

16. The optical input preamplifier, as recited in claim 1, wherein said output circuit unit comprises an amplifying circuit electrically connected with said pre-amplifying means to amplify said pre-amplifying current, a current-to-voltage converter converting said pre-amplifying current into an output voltage, and a buffering circuit buffering said output voltage as said output signal proportional to said output current of said photodiode.

17. The optical input preamplifier, as recited in claim 14, wherein said output circuit unit comprises an amplifying circuit electrically connected with said pre-amplifying means to amplify said pre-amplifying current, a current-to-voltage converter converting said pre-amplifying current into an output voltage, and a buffering circuit buffering said output voltage as said output signal proportional to said output current of said photodiode.

18. The optical input preamplifier, as recited in claim 15, wherein said output circuit unit comprises an amplifying circuit electrically connected with said pre-amplifying means to amplify said pre-amplifying current, a current-to-voltage converter converting said pre-amplifying current into an output voltage, and a buffering circuit buffering said output voltage as said output signal proportional to said output current of said photodiode.

19. The optical input preamplifier, as recited in claim 17, wherein said amplifying circuit arrangement comprises a plurality of amplifying circuits electrically connected in a series connection to amplify said pre-amplifying current from said pre-amplifying means.

5        20. The optical input preamplifier, as recited in claim 18, wherein said amplifying circuit arrangement comprises a plurality of amplifying circuits electrically connected in a series connection to amplify said pre-amplifying current from said pre-amplifying means.